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WASTEWATER MANAGEMENT CASE STUDY

Waipatiki Beach, Hawkes Bay, New Zealand (MoH Sewer Subsidy Scheme)

Waipatiki Beach is a small, seaside community on the east coast of New Zealand's North Island. Prior to the development of the new subdivision, the community comprised 42 existing holiday homes, as well as a small camping ground. The new subdivision has added another 30 lots to the community. Waipatiki Beach has a permanent population of only 1 person, but during the summer the population swells. The settlement has been hampered by septic tank and on-site drain field failure for many years. With the possibility of another 30, poorly-designed and operated on-site systems from the new the development, the Hastings District Council decided to implement a wastewater scheme, combining the existing and new residences. The collection system and treatment plant was partially funded under the MoH Sewer Subsidy Scheme.

Figure 1. – AdvanTex® Treatment System and Control Shed

Using the set criteria Innoflow Technologies NZ Ltd (ITNZL) produced a wastewater management solution that met with the developers and the Hastings District Council's high expectations and strict requirements and the potential buyers economic aesthetic and practical demands.

The land application area was placed in an existing managed pine forest, creating a low visual impact, no odours and enhanced growth of the trees which will be harvested in future years and used for making wood products.

Process Selection

The Hastings District Council, in conjunction with the developer of the new site, decided to undertake an options assessment and run tenders for the wastewater services before a resource consent was sought for the discharge. The assessment was completed and based on the council's past knowledge a Design & Construct specification was prepared calling for a traditional approach; a conventional gravity sewer and pump station to an aerated lagoon to be located 2.2km from the settlement.

The D&C tender allowed for non-conforming bids, and Innoflow offered an Orenco® effluent sewer collection system and AdvanTex® textile packed bed reactor. The project was awarded to Innoflow, principally on a capital and operational cost basis.

Figure 2. – The Orenco® Effluent Sewer was laid in the road reserve

Design Detail

Peak Wastewater Flow	76,000 litres per day
Wastewater Collection Process	An Orenco® Effluent Sewer, comprising on-lot primary treatment tanks and a small diameter effluent sewer
Wastewater Treatment Process	An Orenco AdvanTex® Textile Packed Bed Reactor
Reuse Method(s)	Subsoil pressure compensating drip irrigation @ 5mm per day
Design Effluent Quality	BOD_5 - <10 mg/l TSS - <10 mg/l TN <20 mg/l
Capital Costs	$725,000.00 for the full collection, treatment and reuse scheme
Operation and Maintenance Costs	$68,000 over 5 years

Key Performance Factors

The effluent sewer collection system and AdvanTex® Textile Packed Reactor treatment plant was supplied and installed at Waipatiki for 76 equivalent lots, and for a capital cost of $725,000, some $300,000 less than the nearest conventional bid. The solution provides 10:10 (BOD:TSS) effluent for local irrigation of a nearby young pine forest, rather than taking the wastewater more than 2 kilometres way for treatment.

The treatment system is maintained on a 3-monthly basis, with the on-lot STEP tanks inspected annually. The overall footprint of the packed bed reactor is less than 80m^2, and the low-profile finish of the entire system has little visual impact on the site. The watertight 50mm diameter effluent sewer has meant the treatment plant has only been sized for peak dry weather flows from the homes, and not for wet weather situations, which are now kept out of the pipe network.

Waipatiki presents good evidence for the viability of DWM township retrofits, and indicates that these can bring benefits of both costs, and beneficial local reuse to settlements where historically wastewater has created problems. Rather than prevent future development, local authorities can use it as an opportunity to improve services in establishing communities, and share the associated costs of such improvement with the developer.

Figure 3. Land Application Area

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WAIPATIKI BEACH TEST RESULT SUMMARY

up to June 2009

Date	Biochemical Oxygen Demand (BOD) g/m^3	Total Suspended Solids (TSS) g/m^3	Nitrogen – Total Kjeldahl mg/L	Total Phosphorus (TP) g/m^3	Faecal Coliforms cfu/100ml	E Coli cfu/100mls
Tender Requirements	<30	<30	N/A	N/A	N/A	N/A
28-Feb-06	2	3	2	8.72	4100	
16-Oct-06	2	2	4	4.72	760	
23-Feb-07	8.5	7	4	11.1	130	54
27-Nov-07	9.3	14	1	7.0	Not tested	Not tested
13-Feb-08	3.7	2.0	2.1	1.2	52	26
27-May-08	2.8	2.1	2.8	4.0	2700	1000
10-Sep-08	3.9	3	2	5.7	970	920
15-Feb-09	<1	2	1.7	15	320	270
26-May-09	1.3	3	5	11	120,000	16000
AVE.	**4.2**	**4.5**	**3**	**7.1**	**16,129**	**3,045**
Mean	**3.3**	**3**	**2**	**7**	**865**	**595.0**